

U.S. DEPARTMENT OF AGRICULTURE - FOREST SERVICE
CALIFORNIA FOREST AND RANGE EXPERIMENT STATION
Division of Forest Insect Research

FOREST INSECT CONDITIONS
LASSEN VOLCANIC NATIONAL PARK
RECONNAISSANCE SURVEY
Summer, 1958

Introduction

On July 24, September 4, and October 9, reconnaissance surveys were conducted on the Manzanita Lake, Lost Creek, and Badger Flat units of Lassen Volcanic National Park. Twin Lakes and ~~Chester~~ ^{14.5587} Lakes were checked on September 4, and Summit Lake was inspected October 9. Taking part in these surveys were B.E. Wickman of the Station and Park Forester, Mike Myer. R.L. Rennie, a summer employee for the Station, assisted with the mountain pine-beetle survey on September 4. The Butte Lake unit was examined by Myer in early August. The purpose of these surveys was to appraise the effectiveness of maintenance control and to estimate control needs for the coming year.

Insect and Host Species

The principal host trees in the Park, and their insect enemies toward which insect control is directed, are as follows: In Jeffrey pine, the most prevalent host, there are the Jeffrey pine beetle, Dendroctonus jeffreyi Hopk., and the California flatheaded borer, Melanophila californica Van D.; in ponderosa pine the western pine beetle, D. brevicornis Lec. is an important pest; and in sugar pine and lodgepole pine the mountain pine beetle, D. monticolae Hopk., is a primary tree killer.

Status of Infestation

An upward trend of insect-caused loss in Jeffrey and lodgepole pine was noticeable in the Park this summer. It is estimated that there are at least 2 to 3 times as many Jeffrey pine infested with Jeffrey pine beetle than at this time last year. Several contributing factors are the Jeffrey pine windthrown during the last winter, the large number of summer lightning-struck trees, and the increase of bark beetles in areas near the Park last year. Both windthrown and lightning-struck trees are ideal for attack by Jeffrey pine beetles. The other problem insect this year, mountain pine beetle in lodgepole pine, has shown a sudden population increase, as is common with this insect, in several concentrated areas.

Following is a resume of insect conditions on individual control units within the Park.

Manzanita Lake Unit.--There is increased Jeffrey pine loss. About twelve Jeffrey pines will need treating this year. This is approximately twice as many trees as were treated last year. Several are lightning-struck trees near the Park entrance, and several are infested, windthrown trees on the old Emigrant Road.

Lost Creek Unit.--Jeffrey pine losses are slightly increased this year. Only one sugar pine was treated this year.

Hat Creek-Badger Flat Unit.--The mountain pine beetle is killing groups of lodgepole pine on about 1,000 acres along Hat Creek and Badger Flat. When the area was examined on July 24, the trees infested in 1957 were just beginning to fade and a large increase was noted over 1956 loss. Plans were made at that time for an appraisal of the infestation later in the summer after the 1957 brood of beetles had emerged and made their new attacks. On September 4 the appraisal survey was made in the following manner. Strips $\frac{1}{2}$ -chain wide were run $2\frac{1}{2}$ miles from Badger Flat to Cluster Lakes, 2 miles from Badger Flat to Hat Creek, and $1\frac{1}{2}$ miles along lower Hat Creek. A total of 24 acres was sampled for lodgepole pine loss. On the 24 acres, 25 newly infested trees and 72 recently killed, abandoned trees were found. The average diameter was 14 inches. This was, however, a biased sample through the heaviest infested areas to get a rough idea of what kind of control program would be in order.

The sample was not analyzed statistically because of the bias involved and the fact that new attacks were still being made at the time of the survey. The ratio of 1 newly infested to 3 abandoned trees indicated at that time a drop in the loss for the coming year. However, beetle emergence was much later this summer, probably due to the wet spring, and new attacks were still being made in October. Control work along Hat Creek was deemed advisable after the survey.

On October 9 the area was visited again with Myer. About 30 lodgepole pines had been treated with EDB and another 100 infested trees spotted on several hundred acres along Hat Creek. Quite a few trees were heavily attacked, had pitched out the adult beetles before laying eggs, and had large dead patches of cambium. No treatment was recommended for such trees.

Jeffrey pine loss was higher on the Badger Flat unit this year. Several lightning-struck trees were found infested with Jeffrey pine beetle and attacks were still being made as late as October 9.

Butte Lake Unit.--This unit was not examined by the author, but Myer reported an increase in the number of faded Jeffrey pine on his August visit to the area.

Twin Lakes.--Five lodgepole pine trees heavily infested with mountain pine beetle were found in the camping area on the lake shore during the September visit.

Summit Lake.--The campground area was examined on October 9, and 4 infested lodgepole were found requiring treatment.

At the date of writing this report, control action has either been completed or initiated on all the above-mentioned units.

Discussion

In view of the increase of Jeffrey and mountain pine beetle populations in the Park, the following entomological observations and suggestions for remedial actions are made:

1. Jeffrey pine loss due to the Jeffrey pine beetle has at least doubled. Beetles are attacking trees very late in the fall this year. Lightning-struck and windthrown trees seem especially susceptible and will contribute to next year's losses if not treated. The present losses are not critical, but the upward population trend is serious and warrants careful attention. Therefore, careful spotting for newly infested trees should be continued this fall and Jeffrey pine beetle control work continued until July 1, 1959, if necessary. If infested trees are not treated, increased losses are likely to occur next year.

2. An epidemic population of mountain pine beetle exists in lodgepole pine stands along Hat Creek and Badger Flat. Control work, and especially spotting, should continue along Hat Creek as long as possible this fall. The Badger Flat area should be included in the spring treating program because it is adjacent to and continuous with the Hat Creek lodgepole pine. Failure to treat part of these stands could result in continued mountain pine beetle activity on the treated areas. If possible, the area from Hat Creek east to Badger Flat (about 500 acres) should be spotted this fall. Spotting infested trees is easier during the fall because of the red pitch tubes on the lower tree trunks. Spring control work is facilitated if the number of infested trees is known, and they are mapped and marked ready for treating. Depending on the number of trees spotted, sufficient manpower should be planned for use on the infestation to complete treating by July 15, 1959. If the area is not treated, experience with the mountain pine beetle in lodgepole pine has shown that a large population can cause tree mortality for several years until most of the stand is killed.

It has been found in Yosemite that a 4 or 5-man crew can treat about 10 trees a day. Because of high fire hazard in the infested area, the suggested treating method is to spray smaller trees/with EDB emulsion; the larger trees should be felled and bucked, then sprayed with this insecticide. A new Station research note should be available by next spring describing treating formulations, methods and spray equipment. The present note on the subject can be used in the interim with one exception. ^{standing} 1/

The exception involves a recent change of emulsifiers. Instead of the emulsifiers previously recommended, Triton X-151 and Triton X-171 should be used. In addition, mixing should be done in the exact order and proportions given below:

1/ Forest Research Notes, No. 122, May 7, 1957. Ethylene Dibromide Emulsion Spray for Control of the Mountain Pine Beetle in Lodgepole Pine. By Robert E. Stevens.

3 gallons of diesel oil
3 quarts of emulsifier made from 1 pint Triton X-151
and 5 pints Triton X-171
5 quarts ethylene dibromide (85 percent)
20 gallons water

This formulation makes 25 gallons of mixed spray.

3. With the indications of increased forest insect population in the Park, careful insect surveys with the assistance of a Station entomologist should be planned for the entire Park during the summer of 1959.

Work of the treating crew examined by the writer on October 9 appears to be very good.

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Berkeley, California

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